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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,793	02/20/2002	Clifford N. Click JR.	SUN1P231C1/P3911	2841

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EXAMINER
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PHAM, CHRYSTINE

ART UNIT	PAPER NUMBER
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2192

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/02/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/080,793	CLICK ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Chrystine Pham	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,9,10,12 and 17-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,9,10,12 and 17-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 9, 2007 has been entered.
2. This action is responsive to Amendment filed on January 9, 2007. Claims 18-20 have been amended. Claims 2-8, 11, 13-16 had been canceled. Claims 1, 9, 10, 12, 17-23 are pending.

### ***Response to Amendment***

3. In view of the amendments to claims 18-20 to limit the "computer readable medium" to tangible computer readable medium, that is to say, disavowing nonstatutory subject matter disclosed as a "carrier wave" (Specification, page 9, lines 14-18), the rejection under 35 U.S.C. 101 of claims 18-20 is hereby withdrawn.

### ***Response to Arguments***

4. Applicants' arguments filed January 9, 2007 have been fully considered but they are not persuasive.

While Applicants admit that McQuistan teaches generating a stub, Applicants continue to argue that “McQuistan does not teach an **adapter**” (Remarks, page 7, 1<sup>st</sup> paragraph)(Emphasis added). Applicants further argue that “McQuistan fails to disclose **determining** during runtime **whether to configure** the adapter/stub representation as an **adapter** or as a **stub** for the virtual machine” (Remarks, page 7, 2<sup>nd</sup> paragraph)(Emphasis added). In other words, the stub and the adapter are argued to be distinguished from one another. However, this argument does not appear to be supported by the specification or the drawings. FIG.7 discloses a method of determining whether an adapter is needed to execute compiled code (or to interpret bytecode) and generate an adapter as needed. Nowhere in FIG.7 discloses a step of determining “**whether to generate an adapter or a stub**”. Rather, in both scenarios (i.e., interpreting bytecode and executing compiled code), the only determination is that of whether an adapter is needed. The only drawing deemed supportive of the “stub” is FIG.8. Yet, similar to and yet more general than FIG.7, FIG.8 and associated text only disclose generating an **adapter** for the compiler. Furthermore, page 2 (last paragraph) of the specification defines the adapter as one that “translates the execution stack used by the platform dependent interpreter to a form that is consistent with what the platform dependent compiler expects”. In other words, when the (I/C) **adapter** is generated for the compiler (i.e., execution stack used by the interpreter is translated to a form that can be used by the compiler) as in FIG.8, the (I/C) adapter is referred to as a “stub”. Hence, it follows that when the

execution stack (used to execute compiled code) is translated to a form that can be used by an interpreter, the generated (C/I) adapter is simply referred to the "adapter" to distinguish it from the stub (i.e., I/C adapter). Thus, contrary to Applicants' argument, the stub is not distinguished from the adapter since they are both adapters and Applicants evidently use the terms interchangeably (i.e., "adapter/stub").

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

6. Claims 1, 9, 10, 12, 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander, III et al. (US 6,851,109 B1, "Alexander") in view of Sidik et al. of record (US 5,675,804 A, "Sidik") further in view of Hamby et al. (US 5,848,274 A, "Hamby").

#### **Claim 1**

Alexander teaches in a computer system, a method for dynamically compiling a partially interpreted bytecode program within a virtual machine (see at least Abstract;

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304 FIG.3 & associated text) by constructing (i.e., generating) a new (adapter) method and just-in-time compile the adapter method to replace the partially executed (i.e., interpreted) bytecode (i.e., providing an adapter as needed for a virtual machine during runtime when said virtual machine executes computer code) (see at least col.10:58-col.11:20) comprising:

- identifying a machine state input parameter for a machine state (see at least col.6:26-40);
- identifying input parameters for a call to compiled code (see at least col.6:26-40);
- mapping the machine state input parameter and the machine state to the input parameters for the call to compiled code (see at least col.11:45-67); and
- mapping the machine state and a return value to an exit point of an interpreter to compiled code adapter, thereby generating an adapter/stub representation that can be configured as an adapter for the virtual machine during runtime (see at least col.11:45-67).
- determining during runtime whether to just-in-time compile or interpret the bytecode (i.e., configure the adapter/stub representation as an adapter or as a stub) for the virtual machine (see at least col.10:58-col.11:19).
- providing a stub representation to a compiler for compilation (see at least col.10:58-col.11:19); and
- generating object code base upon the compilation (see at least FIGS.10A-B & associated text).

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*Alexander does not expressly disclose said adapter as an (I/C) adapter that facilitates translation of a first execution stack used by an interpreter associated with the virtual machine when the determining determines to provide the (I/C) adapter, so that the first execution stack can subsequently be used to execute compiled-code compiled by a compiler associated with the virtual machine; and generating a compiled code to interpreter (C/I) adapter that facilitates translation of a second execution stack used for execution of compiled code compiled by a compiler associated with the virtual machine when the determining determines to provide the C/I adapter, so that the second execution stack can be subsequently be used by an interpreter associated with the virtual machine.*

However, Sadik discloses generating an (I/C) adapter (also referred to as a stub) to enable an interpreted method to be called from a compiled method (see at least *adapter code col.2:24-47; col.3:22-65; adapter code 304, stub col.5:47-67*).

Sidik does not expressly disclose translating of a first execution stack used by the interpreter so that the first execution stack can subsequently be used to execute compiled-code compiled by the compiler.

However, Hamby discloses a system and method for dynamically and incrementally compiling bytecode that (see at least Abstract; 3000, 3104, 3112, 3109 FIG.18 & associated text) in which the interpreter's stack machine is translated to a compiler's expression trees (see at least col.28:50-65). It would have been obvious to one of

ordinary skill in the pertinent art at the time the invention was made to incorporate the teaching of Hamby into that of Alexander and Hamby for the inclusion of Sidik's (I/C) adapter that facilitates Hamby's translation of the interpreter's execution stack for the compiler and vice versa (i.e., generating C/I adapter that translates the compiler's execution stack to one that can be used by the interpreter). And the motivation for doing so would have been to enable the compiled portion of the code to invoked the interpreted portion of code from remote location without the compiling the interpreted portion (i.e., portion that does not need to be just-in-time compiled) where a compiler is not available at the remote location (see at least Sidik col.3:22-35).

#### **Claim 9**

The rejection of base claim 1 is incorporated. Hamby further teaches wherein the method is performed in response to a determination that the adapter/stub is not stored in an adapter/stub library associated with the computer system (see at least *compiled, persistent symbol table, database* col.6:25-40; *new code objects, persistent table* col.7:14-37; col.9:22-50; 3000, 3105 FIG.18 & associated text).

#### **Claim 10**

The rejection of base claim 9 is incorporated. Claim recites limitations, which have been addressed in claims 1 and 9, therefore, is rejected for the same reasons as cited in claims 1 and 9.



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**Claim 12**

The rejection of base claim 1 is incorporated. *Alexander* further teaches wherein the adapter/stub is further operable to update the states of different components of the computer system (see at least col.11:1-15; col.12:22-37; FIG.11e & associated text).

**Claim 17**

The rejection of base claim 1 is incorporated. *Alexander* further teaches wherein said determining of whether to provide an I/C adapter or a C/I adapter comprises: determining whether one or more bytecodes have been processed by an interpreter (see at least col.10:59-65).

**Claims 18-20**

Claims recite a tangible computer readable medium including computer program code for performing the method addressed in claims 1, and 17, therefore, are rejected for the same reasons cited in claims 1 and 17.

**Claims 21-23**

Claims recite a computing system comprising at least one processor that performs the method addressed in claims 1, and 17, therefore, are rejected for the same reasons cited in claims 1 and 17.


***Conclusion***

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chrystine Pham whose telephone number is 571-272-3702. The examiner can normally be reached on Mon-Fri, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on 571-272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
TUAN DAM  
SUPERVISORY PATENT EXAMINER